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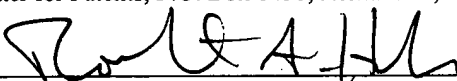
APPLICANT: Mark C. Pace & Thomas W. Cook

APPLICATION NO.:   09/782,616

FILING DATE: February 12, 2001

TITLE: AUTOMATED SERVICE SCHEDULING SYSTEM

CONFIRMATION NO: 9755

EXAMINER: Scott E. Jones

GROUP ART UNIT: 3713

ATTY. DKT. NO.:   19538-05563

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date shown below:

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DECLARATION OF FACT BY MARK C. PACE UNDER 37 C.F.R. § 1.131

I, Mark C. Pace, hereby declare the following:

1.   I am a co-inventor of the invention described and claimed in U.S. Patent

Application Serial No. 09/782,616 (hereinafter "Subject Application"), entitled "Automated

Service Scheduling System," filed on February 12, 2001. The Subject Application claims the

19538/05563/SF/5127442. 1

benefit under 35 U.S.C. § 119(e) of U.S. Provisional Application No. 60/245,903 (hereinafter "Provisional Application"), filed November 3, 2000.

2.   With my co-inventor, I invented the invention as described and claimed in the Subject Application in this country before October 3, 2000, as evidenced by the following:
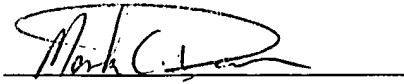
a.   Attached hereto as Exhibit A are selected pages of an Invention Disclosure Form, which was prepared before October 3, 2000. Theses pages illustrate the general conception of a system and method for providing service to customers at service locations, each service location having a communication device adapted to communicate one or more events pertaining to a service event for a customer at the service location. The disclosure includes a description and drawing of the invention as claimed in the Subject Application, including a decisioning system that selects a service attendant to service an event, a communication system to transmit messages to the selected service attendant, and message receivers used by the service attendants to receive the message from the communication system. The Invention Disclosure Form is redacted to remove information not necessary to establish the invention's conception or reduction to practice.

b.   I forwarded this Invention Disclosure Form to a patent attorney for the purpose of filing a patent application, resulting in the November 3, 2000 Provisional Application.
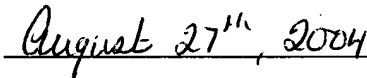
3.   Accordingly, the invention described and claimed in the Subject Application was conceived of before October 3, 2000 and was diligently reduced to constructive practice from before October 3, 2000 to the filing of the Provisional Application on November 3, 2000.

4.   I hereby declare that all statements made herein to the best of my own knowledge are true and that all statements made on information and belief are believed to be true; that these

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statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001; and that such willful statements may jeopardize the validity of the application or any patent issued thereon.

Mark C. Pace

August 27th, 2004
Date

Project Name:
Automated Rules-based 2-way Paging Slot Service Scheduling System

Project Idea Contributors:
Tom Cook
Mark Pace

Current State:
Today slot service delivery on the casino floor is best described as random acts of kindness. This is largely due to the fact that getting slot service is dependent on a service provider's ability to see visual cues or to hear audible tones emitted by a slot machine. Given the amount of activity on a casino floor, especially on busy evenings and weekends, this service identification methodology leads to service that is at best, sporadic.

To maximize the chance of identifying slot service events and reduce the amount of time it takes to respond to a customer's needs, service providers roam through the aisles of slot machines in their assigned section. If, as is often the case, a service provider identifies several simultaneous service needs, he/she is unable to determine which event occurred first and therefore which to respond to first. This service delivery methodology is not only inefficient, but also tends to upset guests who saw other guests attended to first even though they had been waiting for assistance longer.

To address this issue several Harrah's casinos have implemented systems to notify service providers of service events. These systems fall into two categories, Paging and Dispatch.

The old one-way paging systems were installed at various properties and were originally designed to be used as in-house pagers and not for Slot Operations. Lake Tahoe installed theirs in the early 1980's, Atlantic City in 1980, St.Louis and N. Kansas City approximately in 1995. However, none of these paging systems were used to schedule service based on any type of rule or process. They were simply used to provide information that an event had taken place.
What kind of event?

Paging systems rely on a message generated by a Slot Management System (SMS) to identify slot service needs. When a slot machine is in need of service, it sends the SMS a message indicating the type of service required. The SMS in turn, forwards the message to a Paging system. The Paging system parses out the message, identifies the location of the slot machine and pages the service providers working in that section.

This system, although significantly better than the roaming process, has a number of shortcomings. Traditional one-way paging does not verify that the message was actually received by its intended service-providing target. The casino operator must have faith that the message was received, read, understood, and that the service provider was actually delivering the needed service. The paging system also is incapable of identifying which service providers in a given section are busy and which are free. Consequently all incoming service requests are sent to all of

When a slot machine hits a hand-paid jackpot (each slot machine is set to dispense X number of coins into the tray. Once that limit has been reached, the slot machine ceases to dispense coins and enters into a hand-pay lock-out mode. The balance of the jackpot is then hand paid by a slot host), the MPU notifies the SMIB that this event has taken place. The SMIB then sends the SMS a message containing the appropriate information. For a hand-paid jackpot, the SMIB sends and a message which, in the case of Bally Gaming & Systems' SDS is comprised of, Message Type, Transaction Code, Player Card Number, Slot Machine Number, Slot Machine Stand (location) Number, Denomination, Theo. Hold %, Date, Time, Coins Bet, Coins Won, Games Played, Jackpot Amount, Bonus Points, Side ID, Sequence Number, Type Code, and Game Type. These may substantially be the same type of data components that any SMS may send. The SMS then stores this message in its Transaction File and sends a notification message to a set of predetermined terminals. These terminals commonly referred to as Change Booth Terminals (CBs) can be dumb terminals, desktop computers, or any other type of system, such as a paging system. This process is repeated for every type of slot machine event tracked.

What is the relationship between the CB and the rules based system? The CB was not previously mentioned; what is its role (if any) in the invention?

3. SMS transmits service event message to rules-based system
4. Rules-based system parses message, extracting Service Event Type, Service Occurrence Time, Customer Player Card #, Slot Machine Location, Jackpot Amount (if the service event is a jackpot)

The rules are still currently being defined, however here is the list as it currently stands:

1. No customer service event will age longer than 7 minutes for any type of service
2. All service events, once responded to, will be completed within 8 minutes
3. System may optionally be able to display service events on a touch-screen monitor
4. System must be able to display, page, and track both non-responded to (Open) and responded to but not completed (In Progress), service events
5. Diamond Tier customers are the first service priority
6. Platinum Tier customers are the second service priority
7. New card customers will be treated like platinum tier customers and will have joint second service priority
8. Gold Tier customers are the third service priority
9. No Card customer have the least service priority
10. System must be able to identify New Card customers, defined as customers whose Player Card number (sequentially assigned) is greater than a user supplied Player Card number.
11. System should page and possibly display service events on the touch screen monitor if:
    - A Diamond tier customer has waited for longer than 1 minute (Current Time – Outage Time)
    - A Platinum tier customer or a New Card customer, unless they have achieved a higher tier rating, has waited for longer than 3 minutes (Current Time – Outage Time)
    - A Gold tier customer has waited for longer than 5 minutes (Current Time – Outage Time)
    - A No Card customer has waited for longer than 7 minutes (Current Time – Outage Time)
12. Until a service event has been aged to 7 minutes, all service events are based on the priority stated in #11.
13. If a customer service event has aged for longer than 7 minutes, that service event will be given top priority immaterial of what tier the customer belongs to, or whether they have a card or not.
14. Should a display be utilized, the system should display as many service events, both open and in-progress as can be visible on the touch-screen display
15. For each service event, the system should capture, store, and be able to report on Outage Time, Age Time, Appear Time, Work Time, and Completion Time.
    - Outage Time = time of service event as reported by the Slot Data System (SDS)
    - Age Time = time the service event was pending before displayed on the touch-screen
    - Assigned Time = time the service event was accepted by an employee via the 2-way pager.
    - Appear Time = time of employee card-in at the customer's slot machine as reported by SDS (may require employee keypad entry)
    - Completion Time = time the Back In Service message is generated by the slot machine as reported by SDS and/or time the employee sent the completed message via the 2-way pager.

the service providers. This constant barrage of pages overloads and frustrates the service providers leading to pages being ignored, and in some drastic cases, pagers being turned off.

Dispatch systems are modeled after those used by Police Departments and Emergency Medical Technicians. They rely on human interaction between a dispatcher sitting in front of a number of computer monitors, and the service providers on the casino floor. When the dispatcher sees a service event, he/she picks up a 2-way radio and asks for a free service provider in the appropriate area. The service provider then is given the information required and asked to provide the service needed. When the dispatcher is ready to assign another task, he/she can verify that the service provider is free and ready to be dispatched again.

This system is better than traditional one-way paging in that it allows the casino operator to verify that the service provider received the message and that he/she is delivering the service needed. The two-way communication between two human beings, dispatcher and service provider creates a strong sense of teamwork and general esprit-de-corps, however this comes at a price. The cost of staffing even a small Dispatch Center requires at least 4 Full Time Equivalents to cover 24 by 7 at an estimated cost of over $160,000 annually.

The implementation of one or both of these system is a significant improvement over the roaming service delivery methodology, yet both of these systems still rely on the first-in first-out (FIFO) method of slot service scheduling. In today's highly marketed casino industry, where customers are rewarded based on their level of play, the FIFO methodology is at odds with the rewards and incentives programs used by casino operators.

Desired State:
The Automated Rules-based 2-way Paging Slot Service Scheduling ART-PSSS ("art passs") system seeks to marry the best aspects of both the Paging and Dispatch systems while adding functionality that more closely ties in to the rewards and incentive programs used at Harrah's.

At its core, this system will have a database with a set of rules. These rules will dictate specific actions to be undertaken for specific slot service events. The system will be interfaced to Harrah's in-house developed Casino Management System (CMS), the in-house developed customer data warehouse (WINet), and the vendor supplied Slot Management System (SMS).

At a high level the system will function as follows:
1. Slot machine service event occurs

   There are a multitude of slot machine events. Each is reported to and is tracked by the Slot Management System. For our purpose, we will concern ourselves mostly with Jackpot, Hopper Can't Pay, Coin-Out, Coin-In and Bill Accepter Jams. Eventually, we may expand the number of slot machine events that this system will monitor.
   How it Works:
   Each slot machine has a Main Processing Unit (MPU) which is responsible for the game's operation. This chip contains the logic and mathematical formulas that allow the game to function. Each slot machine is also on a Slot Management System (SMS) network and is equipped with an SMS Slot Machine Interface Board (SMIB) The MPU communicates the event to the SMIB which in turn relays information up to the SMS where it is stored, tracked, and reported on. The MPU is proprietary to each slot machine manufacturer, while the SMIB and SMS are proprietary, in the case of our system, to Bally Gaming & Systems, the systems' developer.

2. Slot machine reports service event to SMS

16. Should a display be utilized, for each open service event, the system should display the Age Time
17. Should a display be utilized, for each in-progress service event, the system should display the Age Time and Appear Time
18. System must be able to compute, store, and report on, Response Time, Work Time, and Transaction Time
    - Response Time = Appear Time – Outage Time = length of time a customer waited before an employee appeared to provide them service
    - Work Time = Completion Time – Appear Time = length of time an employee worked to provide the service needed
    - Transaction Time = Completion Time – Outage Time = length of time a customer waited before the service needed was completed.
19. System must be able to capture, store, and report on the number of transactions by type (Jackpot including CMPO or Hopper Fill) that are being completed.
20. System must be able to compute, store, report, and display, if a display is utilized, in real-time the average Transaction Time of each Service Type for each customer tier, on the touch-screen.
21. System must identify events that have exceeded the 7-minute aging time limit and have not been accepted by a service provider and immediately generate an escalation page to a specified pager(s). Additionally, should a display be utilized, system must be able alter the display characteristic (Red) of those service events.
22. System must be able to compute, store and report on service events responded to prior to being either paged or displayed on the touch screen monitor.
23. System must be able to compute, store and report on service events completed prior to being either paged or displayed on the touch screen monitor
24. System must be able to determine and generate an escalation page to a specified pager(s) and if a display is utilized, alter the display characteristics (Blink Red) of in-progress service events that have exceeded the 8-minute time limit.
    - Current Time > Appear Time + 8 minutes
25. System must be able to capture, store and report on the number of transactions completed by type by employee and the service time it took to complete (Appear Time, Work Time and Completion Time)

The Rules Based System (RBS) itself is a tool that can accept, store, and apply a set of rules. The RBS also can accept data input from a variety of sources, apply the rules to the data, and based on those rules take the appropriate action(s).

5. Rules-based system queries CMS and/or WINet to determine the customer's worth or tier

6. Rules-based system applies rules to determine what priority the service event should be given. Priority is based on Customer Tier, Event Type, Event Time, and casino floor staffing levels.

The RBS database is comprised of several tables; Rules, Pagers, Events, and History being the primary ones.
The Rules table houses all of the rules which will be applied.
The Pagers table has a list of all the available pager numbers, the employee carrying the pager and the casino floor section in which he/she is working in. Each pager is also defined as an employee pager or supervisor pager to facilitate escalation paging.
The Events table is were all open and in-progress slot service events are tracked. As events are completed the data is written as new records in the History table.
All reports and queries as to Service Completion Times, Employee Performance, etc will be done off of the History table.
Confirm:

The Event table has columns corresponding to the extracted data from the message, Service Event Type, Service Occurrence Time, Customer Player Card #, Slot Machine Location, Jackpot Amount.
The RBS, when it gets a messages from SMS, and extracts the relevant data, and enters a new event in the Event Table.

7. Rules-based system determines what section of the casino floor the event is located in.

The RBS culls out of the event message the slot machine stand number. This number indicates which section of the casino floor the slot machine is in.

8. Rules-based system determines which service provider is currently free and sends a service request page.

will be either a message sent via TCP/IP over a network or a serial data communication through a dedicated high-speed modem.

At a more detailed level, and from a systematic standpoint, the steps taken for a Jackpot service event are as follows. If a step requires logic and supports two decisions, the positive decision is addressed first and the negative decision is shown indented.

1. Customer hits jackpot
2. Slot machine sends JP message to Slot Management System (SMS)
3. Slot machine locks-up, lights flash, and music plays.
4. SMS sends JP message to rules-based system
5. Rules-based system recognizes JP message, and culls out slot machine, Location, Customer Number, Jackpot Amount, and Event Time
6. Rules-based system triggers <u>Time Tracking program</u> capturing Outage Time
7. Rules-based system access CMS and/or WINet to look up Customer Number
8. Rules-based system applies <u>scheduling matrix logic</u> to prioritize event. This logic will look at all service needs currently in the <u>queue</u>. Based upon the rules defined, the system will decide whether to immediately page this event or age it. In this way, a maximum aging time can be established for each event type and each customer tier. If a service event has reached its maximum aging time, it will be paged next immaterial of the customer's tier
9. Rules-based system selects free employee operating within the identified Location   **RBS looks at the Pagers table, finds the casino section, selects the first employee in the section marked as AVAILABLE and sends the request to him/her.**
10. Rules-based system sends pager number and message (to include text, Stand, Location, JP $, and Customer Tier – D, P, N or G) to 2-way paging system
11. Paging system transmits page
12. Pager receives page and displays message
13. Service provider selects "Accept" message on 2-way pager and presses Enter
      14. Service provider Selects "Decline" message on 2-way pager and presses Enter
      15. Paging system receives "Decline" message and forwards to Rules-based system
            16. Rules-based system will select next available free employee operating within the identified section. The rules-base system will select an employee from the closest section if all of the service providers in the event's section are busy. If no service providers are available, the event will be escalated and supervisory level staff paged.
      17. Rules-based system sends pager number and message (to include text, Stand, Location, JP $) to paging system
      18. Paging system transmits page
      19. Pager receives page and displays message
20. Rules based system triggers Time Tracking program capturing Response Time
21. **Rules based system marks employee as BUSY in the Pagers table**
22. Employee goes to customer location as specified in the pager message

23. Employee inserts Employee Card
24. Slot machine sends Card In message to SMS
25. SMS sends Card In message **(some SMS's may not generate a Card In message as a valid response to certain slot events. In these instances, the employee will use the slot machine keypad to enter a code which will generate a message alerting the RBS that he/she has arrived at the service location)**to specified RBS server

26. Rules based system recognizes Card In message and triggers Time Tracking program capturing Arrival Time
27. Each service event will have an established Service Duration Time associated with it and stored in the Rules based system. Once the Arrival Time has been captured the Rules Based system will track Service Elapsed Time.
28. Rules based system will continually check to see if the Service Elapsed Time has exceeded the established Service Duration Time
      29. Rules based system determines that the Service Duration Time has been exceeded.
      30. Rules based system identifies Supervisor operating in the service area and selects appropriate pager number
      31. Rules based system generates "Service Alert" message
      32. Rules based system sends message and pager number to paging system
   **The RBS will select a Supervisor pager by section from the Pagers table and will generate a Service Alert message when the Service Completion time has been exceeded.**
      33. Paging system transmits page
34. Employee completes service and selects "Done" message from pager and presses Enter
35. Paging system receives message and forwards to Rules based system
36. Rules based system triggers Time Tracking program capturing Service Completed time
37. Rules based system marks the employee as available **in the Pagers table.**

Please see diagram below

Casino Management System stores local proprtyplayer tracking information.

WINet stores brand-wide player tracking information and history.

Casino Management System

Patron Database
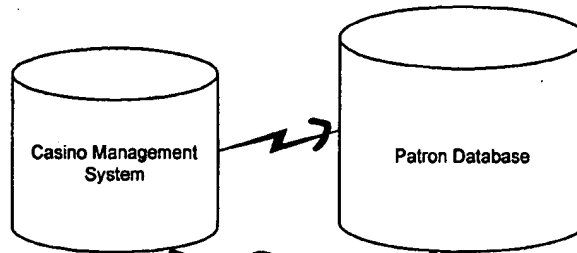
SMS receives the event data. The event data is converted into a Change Booth° message and sent to the Rules Based System. SMS also sends Player tracking data (card #, coin in, coin out, etc.) to CMS.

Paging system receives pager number and text message from RBS and generates page.

Slot machine MPU generated events are sent to SMS via the SMIB located in each machine.

Slot Management System

Rules Based System

Paging System
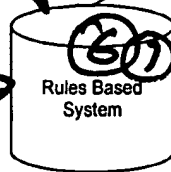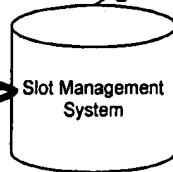
Paging Anenna

RBS receives Change Booth message from SMS, identifies player number, and queries CMS, WINet or both to identify player tier. RBS then identifes service event location, selects available employee and generates page via paging system.